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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/657,386	09/08/2000	Toshiaki Yoshihara	1100.64726	3309

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EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT PAPER NUMBER

2871

DATE MAILED: 05/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/657,386

Applicant(s)

YOSHIHARA ET AL.

Examiner

Prasad R Akkapeddi

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 March 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213..

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)                      4) ☒ Interview Summary (PTO-413) Paper No(s). 10.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.                      6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Amendment***

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Response to Arguments***

2. Applicant's arguments filed 03/17/2000 have been fully considered but they are not persuasive. The original rejections as stated in the Office Action dated December 6, 2002 are still valid.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by JP-5-34724 (identified as Ref. 1 from hereon).

As to claim 1: Ref. 1 discloses a liquid crystal display with a pair of substrates (13,4) with a liquid crystal (3) there between having a spontaneous polarization (Abstract) and an electrode (12) corresponding to a pixel (Fig.1) and a switching element (TFT) that are placed on an inner surface of one of the substrates (4), the switching element to drive the liquid crystal corresponding to a pixel when turned on, and in the abstract discloses that the electric charge stored in all capacitances (maximum charge) is more than two times as much as the product of spontaneous polarization and an area of the pixel electrode (i.e.,  $Q > 2Ps$ ). Hence the spontaneous polarization of the liquid crystal is a magnitude of not more than 1/2 of a maximum quantity of charge that is injected to the liquid crystal display element corresponding to a pixel when the switching element is turned on.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2,5-6, 9-10 and 13-14: are rejected under 35 U.S.C. 103(a) as being unpatentable over Ref. 1 in view of Kodon et al (Kodon) (U.S.Patent No. 5,465,168).

Although Ref. 1 discloses a liquid crystal display device having spontaneous polarization at  $\frac{1}{2}$  the charge of a conventional device, Ref. 1 does not disclose the relationship of dielectric constant to various liquid crystal materials having different spontaneous polarization values. However, in (Col 12, lines 28-63) Kodan for ferroelectric type liquid crystal devices, discloses in great detail the relationship between dielectric constant and spontaneous polarization and the requirement of keeping the dielectric constant at a low value. Kodan also discloses several compositions of liquid crystal material that are commercially available, with varying degrees of spontaneous polarization. Kodan also discloses that several other compositions of liquid crystals may be mixed together (Col 11, line 35-37). So, it is fairly obvious to mix liquid crystal materials having the spontaneous polarization values (15 nC/cm<sup>2</sup>, 10nC/cm<sup>2</sup> and 7nC/cm<sup>2</sup>) and with a dielectric constant of not less than 3. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt different compositions of ferroelectric liquid crystal materials disclosed by Kodan to the liquid crystal display disclosed by Ref. 1, because these devices will enable large angle viewing by better matching the polarity of spontaneous polarization of the liquid crystals with that of an electric field.

7. Claims 3, 7, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ref. 1 in view of Okada et al. (Okada) (U.S. Patent No. 6,177,968).

Ref.1 does not disclose color filters for the three primary colors to carry out a color display. Okada on the other hand, in disclosing a similar ferroelectric

liquid crystal display having spontaneous polarization equal to  $\frac{1}{2}$  of a maximum quantity of charge, discloses color filters (13) of the three primary colors, red (13a), green (13b) and blue (13c). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt different color filters as disclosed by Okada to the liquid crystal display disclosed by Ref. 1, because these filters will enable a color display device.

8. Claims 4, 8, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ref. 1 in view of Iba et al. (Iba) (U.S. Patent No. 6,456,266).

9. Ref. 1 does not disclose a back light emitting three primary colors and the synchronization of these primary colors to carry out a color display. Iba on the other hand, in disclosing a similar liquid crystal display of the ferroelectric type (Col. 8, line 25) discloses the three primary colors (Col. 8, lines 52-65) R, G and B and the associated drive circuit and the ON/Off times and the synchronization necessary to carry out a color display. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt three primary colors and the synchronization with the switching element as disclosed by Iba to the liquid crystal display disclosed by Ref. 1, because this will enable a color display device.

10. Following is the response by the Examiner to the applicant's arguments:

(a) Applicant's argument No. 1 (page 4, lines 6-17): ' The difference between the present invention and Toyoda is further illustrated by the fact that a spontaneous polarization value for a liquid crystal is invariant. ....'.

Examiner's response to argument No. 1: In a telephone call to the Applicant's representative, the Examiner discussed this issue and it was agreed that the spontaneous polarization value is NOT invariant. Besides, the applicant's argument on Page 4, lines 9-13 further substantiates that the spontaneous polarization changes (not invariant), from a maximum to a minimum quantity, with the applied charge.

(b) Applicant's argument No. 2 (Page 5, lines 14-16): In the present invention, however, the quantity of injected charge may be advantageously less than twice the spontaneous polarization.

Examiner's response to argument No. 2: If the charge is less than twice the spontaneous polarization, then 'the spontaneous polarization is greater than 1/2 of the charge'. However, claim 1 recites the limitation 'the spontaneous polarization of the liquid crystal is a magnitude of not more than 1/2 of a quantity of charge'. The two statements appear to contradict with each other and the Examiner is totally confused, as to which statement is properly claimed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

*PRA*

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May 15, 2003

  
**ROBERT H. KIM**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**